AOIT Computer Networking

Lesson 12

Host Access

Teacher Resources

| Resource | Description |
| --- | --- |
| Teacher Resource 12.1 | Assessment Criteria: Internet Services Poster |
| Teacher Resource 12.2 | Presentation and Notes: Internet Service Providers (includes separate PowerPoint file) |
| Teacher Resource 12.3 | Quiz: Host Access |
| Teacher Resource 12.4 | Answer Key: Host Access Quiz |
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Teacher Resource 12.1

Assessment Criteria: Internet Services Poster

Student Names:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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Using the following criteria, assess whether the students met each one.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | Met | Partially Met | Didn’t Meet |
| Using a visual diagram, a chart, or some form of a graphical organizer, the poster provides an accurate and complete comparison of the different Internet services. |  | □ | □ | □ |
| The poster explains the benefits or disadvantages of each service. |  | □ | □ | □ |
| The poster compares the type of service providers and the type of infrastructure used by each. |  | □ | □ | □ |
| The poster uses informative text with bullet points or short phrases. |  | □ | □ | □ |
| The poster is neat and uses proper spelling and grammar. |  | □ | □ | □ |

Additional Comments:

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Teacher Resource 12.2

Presentation Notes: Internet Service Providers

Before you show this presentation, use the text accompanying each slide to develop presentation notes. Writing the notes yourself enables you to approach the subject matter in a way that is comfortable to you and engaging for your students. Make this presentation as interactive as possible by stopping frequently to ask questions and encourage class discussion.

|  |  |
| --- | --- |
| Description: C:\Users\Mika\Documents\My Documents\Pearson\2012\June\11\Networking_Lesson12_Presentation_ROOT_060812\Slide1.JPG  This presentation explains what an Internet service provider, or ISP, is. It describes the different types of ISPs that are available, and explains how an ISP connects you to the Internet. | Presentation notes |
| Description: C:\Users\Mika\Documents\My Documents\Pearson\2012\June\11\Networking_Lesson12_Presentation_ROOT_060812\Slide2.JPG  When you decide on an ISP, it’s important to know which one offers the most effective service at the best price for your location. Depending on your location, you may have a choice of DSL or cable. If your location does not have access to DSL or cable lines, you may need to consider a satellite or dial-up ISP. If you have a business, or if you need extremely reliable service and are willing to pay for it, you may consider a leased-line ISP. | Presentation notes |
| Description: C:\Users\Mika\Documents\My Documents\Pearson\2012\June\11\Networking_Lesson12_Presentation_ROOT_060812\Slide3.JPG  DSL requires equipment at the customer end and at the Internet service provider end. At the customer's location, there is a DSL modem. A DSL filter is installed on each outlet for telephone handsets, to remove the high frequency band. This eliminates interference with the operation of the telephone set and enables simultaneous use.  At the service provider location, there is a DSL Access Multiplexer (DSLAM) to receive customer connections. A DSLAM takes connections from many customers and aggregates them onto a single high-capacity connection to the Internet.  For the most part, your choice of ISPs for DSL service is limited to the same companies that provide phone service in your area, or a secondary provider who is actually reselling you the same DSL service supplied by your phone company. | Presentation notes |
| Description: C:\Users\Mika\Documents\My Documents\Pearson\2012\June\11\Networking_Lesson12_Presentation_ROOT_060812\Slide4.JPG  When you sign up for a cable broadband Internet connection, generally the ISP provides you a cable modem that has a USB port, an Ethernet port, or both USB and Ethernet port. This modem communicates with the cable modem termination system (CMTS) located at the ISP station (sometimes called a “headend”).  One big difference between cable and DSL is that on a cable network, all houses in your neighborhood use the same cable, whereas with DSL, Internet access is provided through your individual phone line. So the data transmission speed for cable may vary according to how many subscribers are using the service at the same time.  Data coming from the Internet to your cable modem uses a 6 MHz channel, just like a single channel of cable TV. Data going from your cable modem to the Internet requires just 2 MHz of bandwidth. | Presentation notes |
| Description: C:\Users\Mika\Documents\My Documents\Pearson\2012\June\11\Networking_Lesson12_Presentation_ROOT_060812\Slide5.JPG  When the customer sends a request for a web page, the satellite software attaches a piece of code (called a tunneling code) to the request. The request is then beamed from the satellite dish installed on your house to a satellite orbiting Earth. The satellite relays the request back down to Earth to the ISP’s network operations center, or NOC, which is where the customer’s actual Internet connection is located. The NOC requests that web page for you and then beams it up to the satellite in space. The satellite beams the page back down to the dish on the customer’s house, and the dish sends the web page through the satellite modem and onto the PC monitor. The whole process typically takes less than half a second!  Typically a completely clear line of sight between the satellite dish and the satellite is required for the system to work. The signal can be absorbed and scattered by rain, and the signal is also impacted by the presence of trees and other vegetation in its path.  The satellites used for two-way Internet service orbit 23,000 miles or more above the equator. This means that a round-trip transmission travels a total of about 92,000 miles. Even though the signals travel at nearly the speed of light, this accounts for more delay than found in Earth-based networks. This delay is known as latency.  As with cable modem ISPs, your data transmission speed may vary according to how many subscribers are using the service at the same time as you. | Presentation notes |
| Description: C:\Users\Mika\Documents\My Documents\Pearson\2012\June\11\Networking_Lesson12_Presentation_ROOT_060812\Slide6.JPG  The type of ISP you choose determines how you connect with your ISP—whether it’s a telephone line, a cable, or a wireless satellite.  Once you are connected to your ISP, the information you send over the Internet gets routed through your ISP’s servers and out to other servers on the Internet on fiber-optic cables. These main Internet servers handle a lot of traffic and are connected also via thick fiber-optic cables. The main Internet servers are known as the Internet backbone. There are backbones across the world that carry data globally, routing data packets along the quickest, smoothest path to their destinations.  Since the Internet covers a large area, it is known as a wide area network, or WAN. In fact, the Internet is the largest of all WANs. | Presentation notes |

Teacher Resource 12.3

Quiz: Host Access

1. Briefly explain the disadvantages of using a dial-up modem connection and why dial-up has largely been replaced by cable and DSL Internet services.
2. Explain the differences between DSL and cable.
3. When and where would someone use satellite Internet, and how would the connection compare with dial-up service?
4. Explain how an Internet service provider connects users to the Internet.
5. List three factors that would lead a person to select one access method over another.

Teacher Resource 12.4

Answer Key: Host Access Quiz

1. Briefly explain the disadvantages of using a dial-up modem connection and why dial-up has largely been replaced by cable and DSL Internet services.

Dial-up is slow and unreliable. Cable and DSL are approximately 25 times faster than dial-up, don’t monopolize the phone connection, and provide more reliable service for a reasonable cost.

1. Explain the differences between DSL and cable.

DSL travels via the phone line while cable Internet uses the TV cable company’s channels and cables. They’re administered by different service providers. DSL is limited to 16,000–18,000 feet of cable length, meaning that residents too far from their ISP can’t get the service, or if they’re at the edge of the network, their service may be slow. Cable Internet users share their connection with neighbors, so the connection may be slower at peak hours when more people are connected.

Cable and DSL modems also differ. DSL requires special filters for the phone lines.

1. When and where would someone use satellite Internet, and how would the connection compare with dial-up service?

Satellite is used in rural and remote areas where residents don’t have access to cable or DSL. Satellite is slower than DSL or cable but faster than dial-up service.

1. Explain how an Internet service provider connects users to the Internet.

When users connect to an ISP, they are connecting to the routers and servers that are linked into the backbone of the Internet. ISPs link to the Internet using fiber-optic cabling.

1. List three factors that would lead a person to select one access method over another.

Factors include: services available in the person’s geographical region, distance from service provider, cost of service, speed of service available, other services already purchased from a service provider, etc.

Teacher Resource 12.5

Key Vocabulary: Host Access

These are terms to be introduced or reinforced in this lesson.

| Term | Definition |
| --- | --- |
| asymmetric connection | DSL and cable are asymmetric in that more bandwidth is allotted to downloads than to uploads. Most Internet users download more than they upload, so this allotment provides them faster speed. |
| broadband | Many signals of different frequency multiplexed on the same cable medium. Cable Internet access is a very good example of broadband, as each TV channel has its own frequency. |
| cable Internet | Type of Internet service provided through the television cable company, delivering good speed at reasonable cost. |
| dial-up Internet | An Internet connection that converts data to analog signals before sending it over the phone line. This ties up the phone line during the data connection. |
| digital subscriber line (DSL) | DSL service is provided through the phone line and offers good speed and reasonable cost. The speed and availability of DSL service depend on the distance a residence is from the service provider. |
| Internet backbone | Large bundles of fiber-optic cable traveling between the main nodes—servers and routers—on the Internet. |
| Internet service provider | A company that provides the service of connecting business or residential networks to the routers on the Internet. |
| leased line (T1, T3, OC3) | A company can lease a phone line for Internet service so that the line is used only for Internet access. Since it’s not shared with a telephone connection, it provides speedy uploads as well as downloads. (T1 = 1.544 megabits per second, T3 = 45 megabits per second, OC3 = 155 megabits per second) |
| satellite Internet | Satellite provides Internet service in remote areas where other service providers can’t reach. |
| T1 line | An older standard for leased lines that has largely been replaced by T3 and T5 lines. Today cable and DSL options are faster than T1 lines. |
| wide area network (WAN) | A network that connects multiple local area networks. The Internet is the largest wide area network. |

Teacher Resource 12.6

Bibliography: Host Access

The following sources were used in the preparation of this lesson and may be useful to you as classroom resources. We check and update the URLs annually to ensure that they continue to be useful.

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